

WHAT IS CLAIMED IS:

1. A method for detecting a CD8⁺ suppressor molecule that has anti-HIV-1 activity, the method comprising:

- (a) contacting a host cell with a replication deficient HIV pseudotyped virus comprising a reporter gene operatively associated with an HIV promoter;
- (b) contacting the host cell with:
 - (i) a sample comprising enriched CD8⁺ cells; or
 - (ii) a sample comprising a cell culture of CD8⁺ cells; or
 - (iii) an extract or media component from (i) or (ii); and
- (c) measuring reporter gene activity,

wherein inhibition of reporter gene activity indicates anti-HIV-1 activity.

2. The method of Claim 1, wherein the reporter gene is expressed during early proviral gene expression.

3. The method of Claim 2, wherein the reporter gene is expressed in place of an early proviral gene.

4. The method of Claim 3, wherein the early proviral gene is a *nef* gene.

5. The method of Claim 1, wherein the pseudotyped virus is an *env* deficient pseudotyped virus.

6. The method of Claim 5, wherein the pseudotyped virus is produced by a method comprising co-transfected DNA for the pseudotyped virus with a vector that encodes a viral envelope protein.

7. The method of Claim 6, wherein the viral envelope protein is an HIV Env protein.

8. The method of Claim 6, wherein the viral envelope protein is a non-HIV viral envelope protein.

9. The method of Claim 1, wherein the reporter gene is a luciferase gene, a chloramphenicol acetyltransferase gene, a growth hormone gene, or a fluorescent protein gene.

10. The method of Claim 9, wherein the reporter gene is a luciferase gene.

11. A method for detecting a CD8⁺ suppressor molecule that has anti-HIV-1 activity, said method comprising:

- (a) contacting a host cell with an *env* deficient HIV pseudotyped virus comprising a reporter gene substituted for an HIV *nef* gene such that said reporter gene is expressed in place of the HIV *nef* gene;
- (b) contacting the host cell with:
 - (i) a sample comprising enriched CD8⁺ cells; or
 - (ii) a sample comprising a cell culture of CD8⁺ cells; or
 - (iii) an extract or media component from (i) or (ii); and
- (c) measuring reporter gene activity,

wherein inhibition of reporter gene activity indicates anti-HIV-1 activity.

12. The method of Claim 11, wherein the reporter gene is a luciferase gene, a chloramphenicol acetyltransferase gene, a growth hormone gene, or a fluorescent protein gene.

13. The method of Claim 12, wherein the reporter gene is a luciferase gene.

14. A diagnostic assay for monitoring clinical progression of HIV infection, the diagnostic assay comprising:

- (a) contacting a host cell with a replication deficient HIV pseudotyped virus comprising a reporter gene operatively associated with an HIV promoter;

(b) contacting the host cell with samples from an HIV infected individual, wherein the samples are collected from the individual at one or more time intervals; and

(c) measuring reporter gene activity at one or more time intervals, wherein an increase in reporter gene activity indicates progression of HIV infection.

15. The method of Claim 14, wherein the reporter gene is expressed during early proviral gene expression.

16. The method of Claim 15, wherein the reporter gene is expressed in place of an early proviral gene.

17. The method of Claim 16, wherein the early proviral gene is a *nef* gene.

18. The method of Claim 16, wherein the pseudotyped virus is an *env* deficient pseudotyped virus.

19. The method of Claim 18, wherein the pseudotyped virus is produced by a method comprising co-transfected DNA for said pseudotyped virus with a vector that encodes a viral envelope protein.

20. The method of Claim 19, wherein the viral envelope protein is an HIV Env protein.

21. The method of Claim 19, wherein the viral envelope protein is a non-HIV viral envelope protein.

22. The method of Claim 14, wherein the reporter gene is a chloramphenicol acetyltransferase gene, a luciferase gene, a growth hormone gene, or a fluorescent protein gene.

23. The method of Claim 22, wherein the reporter gene is a luciferase gene.

24. A diagnostic assay for monitoring clinical progression of HIV infection, the diagnostic assay comprising:

- (a) contacting a host cell with an *env* deficient HIV pseudotyped virus comprising a reporter gene substituted for an HIV *nef* gene such that said reporter gene is expressed in place of the HIV *nef* gene;
- (b) contacting the host cell with samples from an HIV infection individual, wherein the samples are collected from the individual at one or more time intervals; and
- (c) measuring reporter gene activity at one or more time intervals,

wherein an increase in reporter gene activity indicates progression of HIV infection.

25. The method of Claim 24, wherein the reporter gene is a chloramphenicol acetyltransferase gene, a luciferase gene, a growth hormone gene, or a fluorescent protein gene.

26. The method of Claim 25, wherein the reporter gene is a luciferase gene.

27. A method for detecting a compound that suppresses HIV-1 replication, the method comprising:

- (a) contacting a host cell with a replication deficient HIV pseudotyped virus comprising a reporter gene operatively associated with an HIV promoter;
- (b) contacting the host cell with the compound at one or more time intervals; and
- (c) measuring reporter gene activity at one or more time intervals,

wherein inhibition of reporter gene activity at one or more time intervals indicates that the compound suppresses HIV-1 replication.

28. The method of Claim 27, wherein the reporter gene is expressed during early proviral gene expression.

29. The method of Claim 28, wherein the reporter gene is expressed in place of an early proviral gene.

30. The method of Claim 29, wherein the early proviral gene is a *nef* gene.

31. The method of Claim 27, wherein the pseudotyped virus is an *env* deficient pseudotyped virus.

32. The method of Claim 31, wherein the pseudotyped virus is produced by a method comprising co-transfected DNA for the pseudotyped virus with a vector that encodes a viral envelope protein.

33. The method of Claim 32, wherein the viral envelope protein is an HIV Env protein.

34. The method of Claim 32, wherein the viral envelope protein is a non-HIV envelope protein.

35. The method of Claim 27, wherein suppression of HIV-1 is at a stage of viral entry.

36. The method of Claim 35 further comprising the steps of:

- (a) contacting a different host cell with the HIV pseudotyped virus;
- (b) contacting the different host cell with a viral entry inhibitor at one or more time intervals; and
- (c) measuring reporter gene activity at one or more time intervals;

wherein the time intervals at which reporter gene activity is inhibited correspond to time intervals of viral entry.

37. The method of Claim 36, wherein the viral entry inhibitor is an anti-fusion peptide.

38. The method of Claim 37, wherein the anti-fusion peptide is DP107, DP178, T1249 or T649.

39. The method of Claim 36, wherein the viral entry inhibitor is an antibody that disrupts the interaction between a CD4⁺ cell surface receptor and a viral envelope protein.

40. The method of Claim 39, wherein the antibody is a monoclonal antibody that specifically binds to the CD4⁺ receptor.

41. The method of Claim 27, wherein suppression of HIV-1 is at a stage of reverse transcription.

42. The method of Claim 41 further comprising the steps of:

- (a) contacting a different host cell with the HIV pseudotyped virus;
- (b) contacting the different host cell with a reverse transcription inhibitor at one or more time intervals; and
- (c) measuring reporter gene activity at one or more time intervals;

wherein the time intervals at which reporter gene activity is inhibited correspond to time intervals of reverse transcription.

43. The method of Claim 42, wherein the reverse transcription inhibitor is a non-nucleoside reverse transcriptase inhibitor.

44. The method of Claim 43, wherein the reverse transcriptase inhibitor is nevirapine.

45. The method of Claim 27, wherein suppression of HIV-1 is at a stage of early virus gene expression.

46. The method of Claim 45 further comprising the steps of:

- (a) contacting a different host cell with the HIV pseudotyped virus;
- (b) contacting the different host cell with an inhibitor of early virus gene expression at one or more time intervals; and
- (c) measuring reporter gene activity at one or more time intervals,

wherein the time intervals at which reporter gene activity is inhibited correspond to time intervals of early virus gene expression.

47. The method of Claim 46, wherein the inhibitor of early virus gene expression is a Tat inhibitor.